19. DATA SHEETS....Continued

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____

COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

DATA SHEET 16 (Part 2 of 2)

BRAKE POWER AND POWER ASSIST UNITS - OPTIONAL PROCEDURE (S7.10.2)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMP.: _____ °F; WIND VEL./DIRECT.: _____ ; TEST WT: _____ lbs

TIRE PRESSURE (Cold): Front - _____ Rear - _____

ODOMETER READING: Start - _____ Finish - _____

OPTIONAL PROCEDURE FOR INOP. BRAKE POWER & POWER ASSIST UNITS:

Fully charge each unit and disconnect primary source of power, 60-0 mph, in gear, 150-200°F IBT, average deceleration specified in each stop. Number of stops depends on equipment used. Lockup allowed + 10 mph.

Stop No.	Target Decel. (fpsps)	Speed (Act) (mph)	Decel. (Max) (fpsps)	Avg. Sust. Decel.	SD (Recvd)	RF (Max)	Wheel Lockup >10 mph	DIR	Stay In Lane
SYSTEM FAILED: _____									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12	12								
13	12								
14	12								
15	12								

(Continued on next page)

19. DATA SHEETS....Continued

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____
COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

DATA SHEET 17 (Part 1 of 2)
FIRST FADE AND RECOVERY (S7.11)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMP.: _____ °F; WIND VEL./DIRECT.: _____ ; TEST WT: _____ lbs

TIRE PRESSURE (Cold): Front - _____ Rear - _____

ODOMETER READING: Start - _____ Finish - _____

FIRST FADE AND RECOVERY (BASELINE) SCHEDULE:

GVWR, 3 stops, in gear, 30-0 mph, 150-200°F IBT, 10 fpsps decel.

FIRST FADE AND RECOVERY (BASELINE) REQUIREMENTS:

Pedal force 10-60 lb, lockup ≤ 1 wheel, stay in 12 ft lane.

___ MPH			Visual Data						Recorded Data				
Stop No.	Initial Brake Temp., °F		Speed (mph)	Max. Pedal Force (lb)	Avg, Sust. Pedal Force (lb)	Avg. Sust Decel. (fpsps)	Avg. Brake Temp. (°F)		Speed (mph)	Max. Pedal Force (lb)	Avg, Sust. Pedal Force (lb)	Avg. Sust Decel. (fpsps)	Max. Decel. (fpsps)
	F	R					F	R					
1													
2													
3													
AVERAGE													

COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

FIRST FADE AND RECOVERY (FADE) SCHEDULE:

GVWR, 10 stops, in gear, 60-0 mph, 130-150°F IBT, 15 fpsps decel., 0.4 mile interval.

FIRST FADE AND RECOVERY (FADE) REQUIREMENTS:

5 stops at 15 fpsps, 5 stops at 5-15 fpsps, pedal force ≤ 150; terminate PF reading at 5 mph.

(Continued on next page)

19. DATA SHEETS....Continued

____ MPH	Visual Data								
Stop No.	Initial Brake Temp. (°F)				Speed (mph)	Max. Pedal Force (lb)	Avg, Sust. Pedal Force (lb)	Avg, Sust. Decel. (fpsps)	Smoke, Odor or Brake Pull (Symbol Allowed)
	LF	RF	LR	RR					
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
Time: End of first stop to end of last stop; Minutes - _____ , Seconds - _____									

COMMENTS:

Visual pedal force (max) within range above? Yes - _____ , No - _____
(if NO, contact COTR)

Recorder Chart Speed - _____ Multiplier – _____

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

DATA SHEET 17 (Part 2 of 2)

FIRST FADE AND RECOVERY (S7.11)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMP.: _____ °F; WIND VEL./DIRECT.: _____ ; TEST WT: _____ lbs

TIRE PRESSURE (Cold): Front - _____ Rear - _____

ODOMETER READING: Start - _____ Finish - _____

FIRST FADE AND RECOVERY (FADE) SCHEDULE (Continued):

____ MPH				Recorded Data					
Stop No.	Avg. Brake Temp. (°F)		Speed (mph)	Max. Pedal Force (lb)	Avg, Sust. Pedal Force (lb)	Max Decel (fpsps)	Avg Sust. Pedal Force	Applic. Time (sec)	COMMENTS
	F	R							
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
Time: End of first stop to end of last stop: Minutes - _____ , Seconds - _____									

COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

FIRST FADE AND RECOVERY (RECOVERY) SCHEDULE:

GVWR, 5 stops, in gear, 30-0 mph, 10 fpsps decel., 1.0 mile interval.

FIRST FADE AND RECOVERY (RECOVERY) REQUIREMENTS:

5 stops at 10 fpsps, stops 1-4 pedal force $\leq$ 150, stop 5 pedal force + 20 lb to lesser of - 10 or 0.6 times the average baseline pedal force.

19. DATA SHEETS....Continued

Pedal force range (must be computed before next test):

Max - _____ lb Min - _____ lb

Stop No.	Initial Brake Temp. (°F)				Speed (mph)	Max. Pedal Force (lb)	Avg. Sust. Pedal Force (lb)	Avg. Sust. Decel (fpsps)	Smoke, Odor or Brake Pull (Symbol Allowed)
	LF	RF	LR	RR					
_____ MPH Visual Data									
1									
2									
3									
4									
5									

MPH	Avg. Brake Temp. (°F)		Recorded Data			Avg. Sust Decel. (fpsps)			COMMENTS
	F	R							
1									
2									
3									
4									
5									

COMMENTS:

Visual pedal force (max) within range above? Yes - _____ , No - _____
(if NO, contact COTR)

Recorder Chart Speed - _____ Multiplier - _____

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

DATA SHEET 18

SECOND REBURNISH (S7.12)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMP.: _____ °F; WIND VEL./DIRECT.: _____ ; TEST WT: _____ lbs

TIRE PRESSURE (Cold): Front - _____ Rear - _____

ODOMETER READING: Start - _____ Finish - _____

SECOND REBURNISH SCHEDULE:

GVWR, 35 stops in gear, 40-0 mph, 12 fpsps decel, 230-270°F IBT or 1 mile interval whichever is shorter.

SECOND REBURNISH REQUIREMENTS:

Lockup ≤ 1 wheel, stay in 12 ft lane. NOTE: Pedal force may exceed 150 lb.

Visual Data								Recorded Data				
Stop No.	Initial Brake Temp. (°F)				Speed (mph)	Max. Pedal Force (lb)	Avg. Sust. Decel (fpsps)	Avg. Brake Temp. (°F)		Speed (mph)	Avg. Sust. Ped. Force	Avg. Sust. Decel (fpsps)
	LF	RF	LR	RR				F	R			
1												
10												
20												
30												
35												

COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

(Continued on next page)

19. DATA SHEETS....Continued

BRAKE ADJUSTMENT SCHEDULE (Post Burnish):

Adjust service brake per manufacturer's specification.
Record manufacturer's procedure and amount adjusted.

Left Front - _____

Right Front - _____

Left Rear - _____

Right Rear - _____

Manufacturer's Procedure - _____

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____

REMARKS:

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

DATA SHEET 19 (Part 1 of 2)
SECOND FADE AND RECOVERY (S7.13)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMP.: _____ °F; WIND VEL./DIRECT.: _____ ; TEST WT: _____ lbs

TIRE PRESSURE (Cold): Front - _____ Rear - _____

ODOMETER READING: Start - _____ Finish – _____

SECOND FADE AND RECOVERY (BASELINE) SCHEDULE:

GVWR, 3 stops, in gear, 30-0 mph, 150-200°F IBT, 10 fpsps decel.

SECOND FADE AND RECOVERY (BASELINE) REQUIREMENTS:

Pedal force 10-60 lb, lockup ≤ 1 wheel, stay in 12 ft lane.

____ MPH			Visual Data						Recorded Data				
Stop No.	Initial Brake Temp. (°F)		Speed (mph)	Max. Pedal Force (lb)	Avg. Sust. Pedal Force (lb)	Avg. Sust. Decel (fpsps)	Avg. Brake Temp. (°F)		Speed (mph)	Max. Pedal Force (lb)	Avg. Sust. Pedal Force	Avg. Sust. Decel. (fpsps)	Max Decel (fpsps)
	F	R					F	R					
1													
2													
3													
AVERAGE													

COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

SECOND FADE AND RECOVERY (FADE) SCHEDULE:

GVWR, 15 stops, in gear, 60-0 mph, 140-150°F IBT, 15 fpsps decel., 0.4 mile interval.

SECOND FADE AND RECOVERY (FADE) REQUIREMENTS:

10 stops at 15 fpsps, next 5 stops at 5-15 fpsps, pedal force ≤ 150; terminate PF reading at 5 mph.

(Continued on next page)

19. DATA SHEETS....Continued

_____ MPH					Visual Data				
Stop No.	Initial Brake Temp. (°F)				Speed (mph)	Max. Pedal Force (lb)	Avg. Sust. Pedal Force	Avg. Sust. Decel. (fpsps)	Smoke, Odor or Brake Pull (symbol Allowed)
	LF	RF	LR	RR					
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
Time: End of first stop to end of last stop; Minutes - _____ , Seconds - _____									

COMMENTS:

Visual pedal force (max) within range above? Yes - _____ , No - _____
(if NO, contact COTR)

Recorder Chart Speed - _____ Multiplier - _____

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

DATA SHEET 19 (Part 2 of 2)
SECOND FADE AND RECOVERY (S7.13)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMP.: _____ °F; WIND VEL./DIRECT.: _____ ; TEST WT: _____ lbs

TIRE PRESSURE (Cold): Front - _____ Rear - _____

ODOMETER READING: Start - _____ Finish - _____

SECOND FADE AND RECOVERY (FADE) SCHEDULE (Continued):

____ MPH	Recorded Data								
Stop No.	Avg. Brake Temp. (°F)		Speed (mph)	Max. Pedal Force (lb)	Avg. Sust. Pedal Force (lb)	Max Decel. (fpsps)	Avg. Sust. Pedal Force (lb)	Applic. Time (sec)	COMMENTS
	F	R							
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
Time: End of first stop to end of last stop: Minutes - _____ , Seconds - _____									

COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

SECOND FADE AND RECOVERY (RECOVERY) SCHEDULE:

GVWR, 5 stops, in gear, 30-0 mph, 10 fpsps decel., 1.0 mile interval.

19. DATA SHEETS....Continued

SECOND FADE AND RECOVERY (RECOVERY) REQUIREMENTS:

5 stops at 10 fpsps, stops 1-4 pedal force ≤ 150, stop 5 pedal force + 20 lb to lesser of - 10 or 0.6 times the average baseline pedal force.

Pedal force range (must be computed before next test):

Max - _____ lb Min - _____ lb

Stop No.	Initial Brake Temp. (°F)				Speed (mph)	Max Pedal Force (lb)	Avg, Sust. Pedal Force (lb)	Avg. Sust. Decal. (fpsps)	Smoke, Odor, or Brake Pull (symbol Allowed)
	LF	RF	LR	RR					
____ MPH Visual Data									
1									
2									
3									
4									
5									
MPH	Avg. Brake Temp. (°F)		Recorded Data			Avg. Sust. Decel. (fpsps)			COMMENTS
	F	R							
1									
2									
3									
4									
5									

COMMENTS:

Visual pedal force (max) within range above? Yes - _____ , No - _____
(if NO, contact COTR)

Recorder Chart Speed - _____ Multiplier - _____

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts – _____

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

DATA SHEET 20

THIRD REBURNISH (S7.14)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMP.: _____°F; WIND VEL./DIRECT.: _____ ; TEST WT: _____ lbs

TIRE PRESSURE (Cold): Front - _____ Rear - _____

ODOMETER READING: Start - _____ Finish - _____

THIRD REBURNISH SCHEDULE:

GVWR, 35 stops in gear, 40-0 mph, 12 fpsps decel, 230-270°F IBT or 1 mile interval whichever is shorter.

THIRD REBURNISH REQUIREMENTS:

Lockup ≤ 1 wheel, stay in 12 ft lane. NOTE: Pedal force may exceed 150 lb.

Visual Data								Recorded Data				
Stop No.	Initial Brake Temp. (°F)				Speed (mph)	Max. Pedal Force (lb)	Avg. Sust. Decel. (fpsps)	Avg. Brake Temp. (°F)		Speed (mph)	Avg. Sust. Ped. Force (lb)	Avg. Sust. Decel. (fpsps)
	LF	RF	LR	RR				F	R			
1												
10												
20												
30												
35												

COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

(Continued on next page)

19. DATA SHEETS....Continued

BRAKE ADJUSTMENT:

Adjust service brake per manufacturer's specification.
Record manufacturer's procedure and amount adjusted.

Left Front - _____

Right Front - _____

Left Rear - _____

Right Rear - _____

Manufacturer's Procedure - _____

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____

REMARKS:

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

DATA SHEET 21 (Part 1 of 2)

FOURTH EFFECTIVENESS (S7.15)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMP.: _____ °F; WIND VEL./DIRECT.: _____ ; TEST WT: _____ lbs

TIRE PRESSURE (Cold): Front - _____ Rear - _____

ODOMETER READING: Start - _____ Finish - _____

FOURTH EFFECTIVENESS SCHEDULE:

GVWR, 6 stops, in neutral, 30 & 60-0 mph, 150-200°F IBT.

FOURTH EFFECTIVENESS REQUIREMENTS:

1 stop, 30 mph 57 ft, 60 mph 216 ft, pedal force ≤ 150, lockup ≤ 1 wheel, stay in 12 ft lane

ENTER DATA IN FOURTH EFFECTIVENESS TABLE SHOWN ON NEXT PAGE.

COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____

REMARKS:

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

Stop Number	Initial Brake Temperature, °F		Speed (mph)	Stopping Distance (feet)	Maximum Pedal Force (fpsps)	Maximum Decel. (fpsps)	Wheel Lockup above 10 mph	Direction of Stop	Stay In Lane
	F	R							
30 mph			**Visual Data**						
1									
2									
3									
4									
5									
6									
60 mph			**Visual Data**						
1									
2									
3									
4									
5									
6									
30 mph			**Recorded Data**				**Wheel Lockup**	**Average Sustained Pedal Force**	**Average Sustained Decel. (fpsps)**
1									
2									
3									
4									
5									
6									
60 mph			**Recorded Data**						
1									
2									
3									
4									
5									
6									

19. DATA SHEETS....Continued

DATA SHEET 21 (Part 2 of 2)

FOURTH EFFECTIVENESS (S7.15)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMP.: _____ °F; WIND VEL./DIRECT.: _____ ; TEST WT: _____ lbs

TIRE PRESSURE (Cold): Front - _____ Rear - _____

ODOMETER READING: Start - _____ Finish - _____

FOURTH EFFECTIVENESS SCHEDULE:

GVWR, 4 stops, in neutral, 80 & 95 or 100 mph, 150-200°F IBT.

FOURTH EFFECTIVENESS REQUIREMENTS:

1 stop, 80 mph 405 ft, ___ mph ___ ft, pedal force ≤ 150, lockup ≤ 1 wheel, stay in 12 ft lane

ENTER DATA IN FOURTH EFFECTIVENESS TABLE SHOWN ON NEXT PAGE.

COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____

REMARKS:

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

Stop Number	Initial Brake Temperature, °F		Speed (mph)	Stopping Distance (feet)	Maximum Pedal Force (lb)	Maximum Decel. (fpsps)	Wheel Lockup above 10 mph	Direction of Stop	Stay In Lane
	F	R							
80 mph			**Visual Data**						
1									
2									
3									
4									
_____ mph			**Visual Data**						
1									
2									
3									
4									
80 mph			**Recorded Data**				**Wheel Lockup**	**Average Sustained Pedal Force**	**Average Sustained Decel. (fpsps)**
1									
2									
3									
4									
_____ mph			**Recorded Data**						
1									
2									
3									
4									

COMMENTS:

19. DATA SHEETS....Continued

DATA SHEET 22
WATER RECOVERY (S7.16)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMP.: _____ °F; WIND VEL./DIRECT.: _____ ; TEST WT: _____ lbs

TIRE PRESSURE (Cold): Front - _____ Rear - _____

ODOMETER READING: Start - _____ Finish - _____

WATER RECOVERY (BASELINE) SCHEDULE:

GVWR, 3 stops, in gear, 30-0 mph, 150-200°F IBT, 10 fpsps decel.

WATER RECOVERY (BASELINE) REQUIREMENTS:

Pedal force 10-60 lb, lockup ≤ 1 wheel, stay in 12 ft lane.

MPH	Visual Data							Recorded Data			
Stop No.	Initial Brake Temp. (°F)		Speed (mph)	Max. Pedal Force (lb)	Avg. Sust. Pedal Force (lb)	Avg. Sust. Decel. (fpsps)	Speed (mph)	Max. Pedal Force (lb)	Avg. Sust. Pedal Force (lb)	Avg. Sust. Decel. (fpsps)	Max. Decel. (fpsps)
	F	R									
1											
2											
3											
AVERAGE											

COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

WATER RECOVERY (RECOVERY) SCHEDULE:

Drive back and forth at 5 mph for 2 minutes in 6-inch deep water.
GVWR, 5 stops, in gear, 30-0 mph, 10 fpsps, stops initiated as soon as 30 mph is reached.

WATER RECOVERY (RECOVERY) REQUIREMENTS:

4 stops at 10 fpsps, pedal force 150 lb, 5th stop, max. baseline plus 45 lb. All stops, min. force baseline minus 10 lb or times 0.6.

19. DATA SHEETS....Continued

Pedal force range (must be computed before next test):

Max - _____ lb Min - _____ lb

MPH	Visual Data					Recorded Data			
Stop No.	Speed (mph)	Max. Pedal Force (lb)	Avg. Sust. Pedal Force (lb)	Avg. Sust. Decel. (fpsps)	Speed (mph)	Max. Pedal Force (lb)	Avg. Sust. Pedal Force (lb)	Max. Decel. (fpsps)	Max. Decel. (fpsps)
1									
2									
3									
4									
5									

COMMENTS:

Visual pedal force (max) within range above? Yes - _____ , No - _____
(if NO, contact COTR)

Recorder Chart Speed - _____ Multiplier - _____

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____

REMARKS:

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

DATA SHEET 23

SPIKE STOPS (S7.17)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMP.: _____ °F; WIND VEL./DIRECT.: _____ ; TEST WT: _____ lbs

TIRE PRESSURE (Cold): Front - _____ Rear - _____

ODOMETER READING: Start - _____ Finish - _____

SPIKE STOPS SCHEDULE:

GVWR, 10 stops in neutral, 30-0 mph, 200 lb pedal force in 0.08 sec, 150-200°F IBT, no rev stops or brake adj.

SPIKE STOPS REQUIREMENTS:

Complete stops without failure, lockup allowed.

30 mph			Visual Data			Recorded Data					
Stop No.	Initial Brake Temp. (°F)		Speed (mph)	Max. Pedal Force (lb)	Speed (mph)	Max. Pedal Force (lb)	Avg. Sust. Pedal Force (lb)	First Peak Pedal Force (lb)	Time To First Peak (sec)	Proj. Time To 200 lb (sec)	Actual Time To Max PF (sec)
	F	R									
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

(Continued on next page)

19. DATA SHEETS....Continued

POST SPIKE EFFECTIVENESS SCHEDULE:

GVWR, 6 stops, in neutral, 60-0 mph, 150-200°F IBT.

POST SPIKE EFFECTIVENESS REQUIREMENTS:

1 stop, 60 mph 216 ft, pedal force ≤ 150 lb, lockup ≤ 1 wheel, stay in 12 ft lane.

Stop Number	Initial Brake Temperature, °F		Speed (mph)	Stopping Distance (feet)	Maximum Pedal Force (lb)	Maximum Decel. (fpsps)	Wheel Lockup above 10 mph	Direction Of Stop	Stay In Lane
	F	R							
60 mph Visual Data									
1									
2									
3									
4									
5									
6									
60 mph Recorded Data							Wheel Lockup	Average Sustained Pedal Force	Average Sustained Decel. (fpsps)
1									
2									
3									
4									
5									
6									

COMMENTS:

Recorder Chart Speed - _____ Multiplier - _____

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____

REMARKS:

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

DATA SHEET 24 (Part 1 of 5)
TEST COMPLETION INSPECTION (S7.18)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMPERATURE: _____ °F; WIND VELOCITY & DIRECTION: _____
TEST COMPLETION INSPECTION REQUIREMENTS:
No fracture of any components such as brake springs, brake shoe, or disc pads facing. All mechanical components shall be intact and functional. Friction facing tear out shall not exceed 10% of the lining on any single frictional element. No visible brake fluid or lubricant on the friction surface of the brake. No leakage at any system reservoir cover, seal, or filler opening.

Friction Material Condition: Primary/Inner		**Friction Material Condition: Secondary/Outer**	
LF		LF	
RF		RF	
LR		LF	
RR		RR	
Drum (or Rotor) Condition:		**Brake Fluid/Lubricant Inside Brakes:**	
LF		LF	
RF		RF	
LR		LR	
RR		RR	
Hydraulic Component Condition:		**Mechanical Component Condition:**	
LF		Brk/Ped	
RF		Pow/Brk	
LR		Stop/Lamp	
RR		Linkage	
M/Cyl		Other	

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

DATA SHEET 24 (Part 2 of 5)

TEST COMPLETION INSPECTION (S7.18)

VEHICLE: _____ ; NHTSA NO.: _____ ; GVWR: _____ lb

MASTER CYLINDER RESERVOIR:

DATE			Requirements	Pass	Fail
Reservoir Compartments					
(1) Does master cylinder have a reservoir compartment for each brake subsystem?		Yes ___ No ___	Master cylinder shall have a reservoir compartment for each subsystem.		
(2) Does loss of fluid in one compartment result in complete loss from another compartment?		Yes ___ No ___	Loss of fluid from one compartment shall not cause complete loss from another compartment.		
Reservoir Capacity					
Shall conform to requirements (1) or (2), state units: **(1) For reservoirs having completely separate compartments for each subsystem:**					
Subsystem 1 Subsystem reservoir capacity			Shall have a minimum capacity equivalent to the fluid displacement resulting when all wheel cylinders or caliper pistons serviced by that portion of the reservoir move from a new lining, fully retracted position to a fully worn, properly adjusted, fully applied position.		
Subsystem 1 Fluid displaced					
Subsystem 2 Subsystem reservoir capacity			Same as above		
Subsystem 2 Fluid displaced					
(2) For reservoirs utilizing a portion of the reservoir for a common supply to two or more subsystems:					
Total minimum capacity for the entire master cylinder reservoir.					
Fluid displaced					
Subsystem 1 Min volume in partial compartment			Shall have total minimum capacity for entire reservoir for displacement resulting from all subsystem wheel cylinders or caliper positions moving from new lining to full worn condition as above. Shall have minimum reservoir volume in partial compartment equal to at least the volume displaced by the master cylinder piston servicing the subsystem.		
Subsystem 1 Fluid displaced					
Subsystem 2 Min volume in partial compartment			Same as above		
Subsystem 2 Fluid displaced					

19. DATA SHEETS....Continued

DATA SHEET 24 (Part 3 of 5)

TEST COMPLETION INSPECTION (S7.18)

VEHICLE: _____ ; NHTSA NO.: _____ ; GVWR: _____ lb

MASTER CYLINDER RESERVOIR:

DATE			Requirements	Pass	Fail
Master Cylinder Piston Displacement					
Fluid displaced by three strokes of master cylinder piston. Primary (Subsystem No. 1)			Individual partial compartments of reservoir shall each have a minimum of fluid equal to at least the volume displaced by the master cylinder piston servicing the subsystem during a full stroke of the piston.		
Fluid displaced by three strokes of master cylinder piston. Secondary (Subsystem No. 2)					
Fluid displaced per stroke, Primary					
Fluid displaced per stroke, Secondary					
Fluid available in partial compartment Subsystem No. 1					
Fluid available in partial compartment Subsystem No. 2					
Brake Power Unit Reservoir					
Volume displaced in charging system piston or accumulator to normal operating pressure plus wheel cylinder or caliper piston displacement.			Shall have a capacity at least equal to fluid displacement required to charge the system pistons on accumulators to normal operating pressure plus displacement when wheel cylinders or caliper pistons move from new lining to full worn condition as above.		
Reservoir Labeling					
Exact copy of reservoir label: _____ _____ _____			Label shall read: "Warning, clean filler cap before removing; use only fluid* from a sealed container". * Fluid type specified in 48 CFR 571.116		
Measure letter height			Letters shall be at least 0.125" high		
Describe label attachment method and location. _____ _____ _____			Label shall be permanently affixed, engraved or embossed and located so as to be visible by direct view either on or within 4 inches of the brake fluid reservoir filler plug or cap.		
Does the lettering contrast with the background?		Yes ___ No ___	If label is not engraved or embossed, letters shall be of a color that contrasts with the background		

19. DATA SHEETS....Continued

DATA SHEET 24 (Part 4 of 5)

TEST COMPLETION INSPECTION (S7.18)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

Condition	Answer	Requirements	Pass	Fail
Brake Systems Indicator Lamp				
Describe location of brake indicator lamp:		Shall be in front, and in clear view, of driver.		
Does lamp light with ignition (start) switch at ON/RUN?	Yes ___ No ___			
Does lamplight with ignition between ON and Start?	Yes ___ No ___			
Condition	**Light ON?**	**Requirement**	**Pass**	**Fail**
(a) In event of hydraulic leak (1) On or before appearance of pressure differential of 225 psi		SPLIT SERVICE BRAKE SYSTEMS: When ignition (Start) switch is ON, lamp must light either for each one of (a), (c) or (d), or for each one of (b), (c) or (d).		
(2) On or before brake application force reaches 50 lb (manual system)				
(3) On or before brake application force reaches 25 lb (power assisted system)				
(4) On or before supply pressure to brake power unit falls to 50%				
(b) If any reservoir falls below either "safe" level or 25% of capacity (c) If total electrical failure of antiskid or proportion system (d) If Parking Brake applied Lamp(s) burn steady - _____		SERVICE BRAKE SYSTEM NOT SPLIT: When Ignition is ON, lamp must light and alarm sound when supply pressure falls to 50% normal Normal pressure - _____ Alarm pressure - _____ Lamp(s) flash - _____		

19. DATA SHEETS....Continued

DATA SHEET 24 (Part 5 of 5)

TEST COMPLETION INSPECTION (S7.18)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

Condition	Answer	Requirements	Pass	Fail
State lens color:	_____	Lens and lettering shall be of contrasting colors, one of which is RED (except as noted below): Common lamps: BRAKE STOP-BRAKE FAILURE Separate lamps: BRAKE PRESSURE BRAKE FLUID BRAKE ELECTRIC BRAKE PARK of PARK If vehicle is equipped with antilock system it MAY have a separate lens labeled ANTILOCK. Lens and letters shall have contrasting colors, one of which is YELLOW. Letters to be at least 0.125" high and 0.250" high for vehicles without a split hydraulic brake system. Shall be legible to driver in daylight. Shall be a continuous or intermittent audible signal for vehicles without a split hydraulic system.		
State letter color:	_____			
State number of brake system indicator lamps used	_____			
If only one lamp is used, is it labeled "BRAKE"?	Yes ___ No ___			
If separate indicator lamps are used, list labels:	_____ _____ _____ _____			
Is there a separate lens labeled "ANTILOCK"	Yes ___ No ___			
Measure letter height on each lens.	_____ _____ _____ _____			
Labels less than 0.125" high	_____			
Labels 0.250" or more high	_____			
Are all lamps legible to driver in daylight?	Yes ___ No ___			
Is there an intermittent or continuous audible signal?	Yes ___ No ___			

19. DATA SHEETS....Continued

DATA SHEET 25

MOVING BARRIER TEST (S7.19)

VEHICLE: _____ ; NHTSA NO.: _____ ; DATE: _____

TEMP.: _____ °F; WIND VEL./DIRECT.: _____ ; TEST WT: _____ lbs

TIRE PRESSURE (Cold): Front - _____ Rear - _____

ODOMETER READING: Start - _____ Finish - _____

VEHICLE WEIGHT: _____ lb; MOVING BARRIER WEIGHT: _____ lb

MOVING BARRIER TEST (Only for Vehicles Tested Per the Optional Parking Brake Test Procedure):

With parking brake released and parking mechanism engaged, impact the vehicle from the front at 2.5 mph with the moving barrier. Repeat from rear.

REQUIREMENTS: Parking mechanism shall not disengage or fracture in any manner permitting vehicle movement.

FRONT END IMPACT:

Impact Speed - _____ mph (Visual) Impact Speed - _____ mph (Recorded)

Did parking mechanism disengage? Yes - _____ No - _____

Was parking mechanism damaged? Yes - _____ No - _____

If yes, describe: _____

Vehicle moved _____ inches during impact test.

COMMENTS:

19. DATA SHEETS....Continued

REAR END IMPACT:

Impact Speed - _____ mph (Visual) Impact Speed - _____ mph (Recorded)

Did parking mechanism disengage? Yes - _____ No - _____

Was parking mechanism damaged? Yes - _____ No - _____

If yes, describe: _____

Vehicle moved _____ inches during impact test.

COMMENTS:

REMARKS:

DATA INDICATES COMPLIANCE: Yes - _____ ; No - _____ ; No Reqmts - _____

DRIVER: _____ ; OBSERVER: _____

RECORDED DATA PROCESSED BY: _____ DATE: _____

APPROVING LAB. OFFICIAL: _____ DATE: _____

19. DATA SHEETS....Continued

DATA SHEET 26

CALCULATION OF MINIMUM RESERVOIR VOLUME REQUIREMENTS

BRAKE		LINING		
LOCATION	**TYPE**	**DESCRIPTION**	**MINIMUM THICKNESS**	**THICKNESS TO FULLY WORN (1) in.**
Left Front	Drum _____ Disc _____	Leading _____ Primary _____ Inboard _____	Pretest - _____ Post Test - _____ Δ - _____	
		Trailing _____ Secondary _____ Outboard _____	Pretest - _____ Post Test - _____ Δ - _____	
LINING CLEARANCE: Diametral (2) _____ ; Inboard _____ ; Outboard _____				
WHEEL CYLINDER DIAMETER (3) _____ ; CALIPER PISTON DIAMETER (3) _____				
SHOE CAGE DIAMETER (4) _____ ; CENTER POINT OF BRAKE ASSY TO CENTER POINT OF W.C. _____				
Right Rear	Drum _____ Disc _____	Leading _____ Primary _____ Inboard _____	Pretest - _____ Post Test - _____ Δ - _____	
		Trailing _____ Secondary _____ Outboard _____	Pretest - _____ Post Test - _____ Δ - _____	
LINING CLEARANCE: Diametral (2) _____ ; Inboard _____ ; Outboard _____				
WHEEL CYLINDER DIAMETER (3) _____ ; CALIPER PISTON DIAMETER (3) _____				
SHOE CAGE DIAMETER (4) _____ ; CENTER POINT OF BRAKE ASSY TO CENTER POINT OF W.C.				
SUBSYSTEM 1 CONSISTS OF:	LF _____	LR _____	RF _____	RR _____
SUBSYSTEM 2 CONSISTS OF:	LF _____	LR _____	RF _____	RR _____
(1) MFRS RECOMMENDATIONS ____ ; REAR - TOP OF RIVET HEADS ____ ; FRONT - 1/32 INCH _____				
(2) DRUM BRAKES, MEASURED AT HORIZONTAL CENTERLINE				
(3) MFRS DATA				
(4) RESET POSITION				

19. DATA SHEETS....Continued

DATA SHEET 27

DATA FOR CALCULATION OF MINIMUM RESERVOIR VOLUME REQUIREMENTS

BRAKE		LINING		
LOCATION	**TYPE**	**DESCRIPTION**	**MINIMUM THICKNESS**	**THICKNESS TO FULLY WORN (1) in.**
Left Front	Drum ___ Disc __X	Leading ____ Primary ____ Inboard ___X	Pretest - 0.425 Post Test - 0.403 Δ - 0.022	0.324
		Trailing _____ Secondary _____ Outboard ___X	Pretest - 0.393 Post Test - 0.380 Δ - 0.013	0.300
LINING CLEARANCE: Diametral (2) ___N/A___ ; Inboard ___0___ ; Outboard ___0___				
WHEEL CYLINDER DIAMETER (3) ___N/A___ ; CALIPER PISTON DIAMETER (3) ___2.38"				
SHOE CAGE DIAMETER (4) ___N/A___ ; CENTER POINT OF BRAKE ASSY TO CENTER POINT OF W.C. ___N/A				
Right Rear	Drum __X Disc ____	Leading ___X Primary ____ Inboard _____	Pretest - 0.206 Post Test - 0.200 Δ - 0.006	0.122
		Trailing ___X Secondary _____ Outboard _____	Pretest - 0.238 Post Test - 0.231 Δ - 0.007	0.179
LINING CLEARANCE: Diametral (2) __0.030"___ ; Inboard ___N/A___ ; Outboard ___N/A				
WHEEL CYLINDER DIAMETER (3) __0.750"___ ; CALIPER PISTON DIAMETER (3) ___N/A				
SHOE CAGE DIAMETER (4) __9.45"___ ; CENTER POINT OF BRAKE ASSY TO CENTER POINT OF W.C. ___3"				
SUBSYSTEM 1 CONSISTS OF:	LF _____X_____	LR _____	RF _____X_____	RR _____
SUBSYSTEM 2 CONSISTS OF:	LF _____	LR _____X_____	RF _____	RR _____X_____
(1) MFRS RECOMMENDATIONS ____ ; REAR - TOP OF RIVET HEADS ____ ; FRONT - 1/32 INCH ____				
(2) DRUM BRAKES, MEASURED AT HORIZONTAL CENTERLINE				
(3) MFRS DATA				
(4) RESET POSITION				

20. FORMS

LABORATORY NOTICE OF TEST FAILURE TO OVSC

FMVSS NO.: 105 TEST DATE: _____

LABORATORY: _____

CONTRACT NO.: DTNH22-_____ ; DELV. ORDER NO.: _____

LABORATORY PROJECT ENGINEER'S NAME: _____

TEST VEH. MAKE/MODEL/BODY STYLE: _____

VEHICLE NHTSA NO.: _____; VIN: _____

VEHICLE MODEL YEAR: _____; BUILD DATE: _____

TEST FAILURE DESCRIPTION: _____

_____

_____

_____

_____

S105 REQUIREMENT, PARAGRAPH ____ : _____

_____

_____

_____

NOTIFICATION TO NHTSA (COTR): _____

DATE: _____ BY: _____

REMARKS: _____

20. FORMS....Continued

MONTHLY TEST STATUS REPORT

FMVSS 105

DATE OF REPORT: _____

NO.	VEHICLE NHTSA NO., MAKE & MODEL	COMPLIANCE TEST DATE	PASS/ FAIL	DATE REPORT SUBMITTED	DATE INVOICE SUBMITTED	INVOICE PAYMENT DATE
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						

20. FORMS....Continued

MONTHLY VEHICLE STATUS REPORT

FMVSS 105

DATE OF REPORT: _____

NO.	VEHICLE NHTSA NO., MAKE & MODEL	DATE OF DELIVERY	ODOMETER READING	TEST COMPLETE DATE	VEHICLE SHIPMENT DATE	ODOMETER READING
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						

APPENDIX 1A

Procedure and Example for Determining Master Cylinder Volume Requirement

The procedure followed for determining the minimum volume requirements is outlined in the example shown below. The required data is taken from Table 1A-1.

DETERMINATION OF MASTER CYLINDER MINIMUM VOLUME REQUIREMENTS

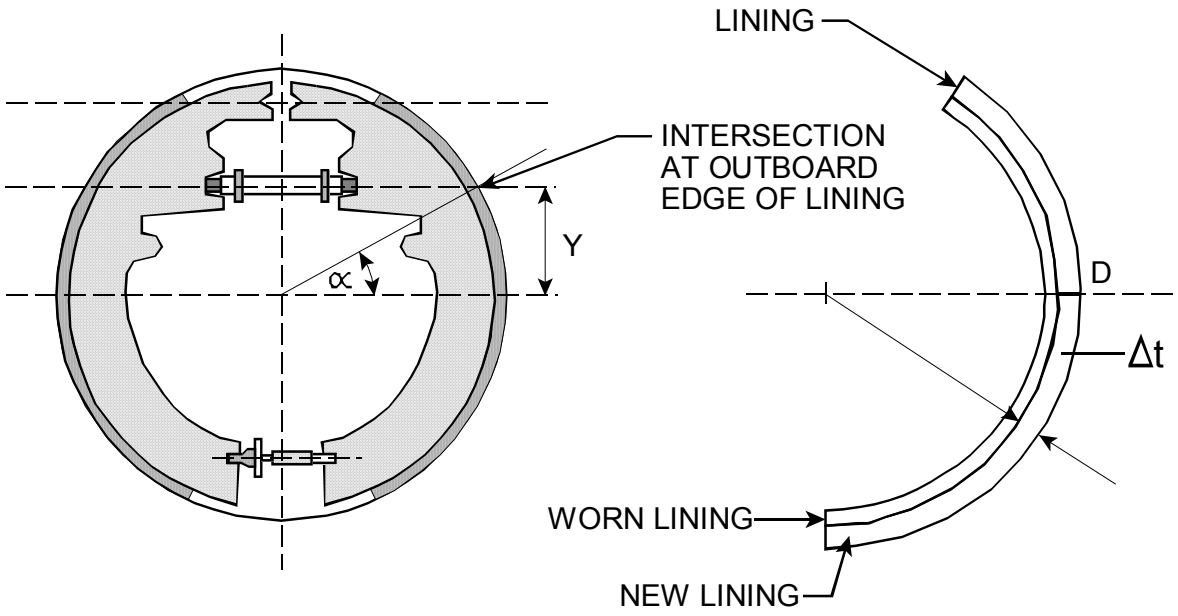

FIGURE 1A

DRUM BRAKES

Volume Required, $V_r = [(2C + \Delta t_s + \Delta t_p)/\cos^{\propto}] \times A \times NWC$, where --

:	V_r =	Volume required per wheel
	C =	Manufacturer's recommended drum-to-lining clearance
	Δt_p =	Change in thickness of primary lining
	Δt_s =	Change in thickness of secondary lining
	Y =	Center point of wheel cylinder to center point of brake assembly
	A =	Cross sectional area of the wheel cylinder bore
	NWC =	Number of wheel cylinders serviced by the reservoir in question
	$\propto$ =	$Sin^{-1}(2Y/D)$
	D =	Cage diameter

APPENDIX 1A....Continued

DISC BRAKES

Volume Required, $V_v = (\Delta t_i + \Delta t_{ic} + \Delta t_o + \Delta t_{oc}) \times [\pi(D^2)]/4$, where --

:	V_v =	Volume required per wheel
	Δt =	Change in thickness (average)
	i =	inboard
	o =	Outboard
	D =	Caliper cylinder diameter
	c =	Average clearance

Using the above equations, the volume requirements for Subsystem No. 1 (LF, RR) and Subsystem No. 2 (LF, RF) were calculated as shown below:

Drum Brakes (rear):

$V_r = (2C + \Delta t_p + \Delta_s \times 1)/\cos \propto$

$C = 0.025$ in.

$\Delta t_p = 0.122$ in.

$\Delta t_s = 0.179$ in.

$D = 9.45$ in.

$\propto = \text{Sin}^{-1} (2 \times 3)/9.45 = 39.4°$; cos % = 0.772

$A = \pi \times (0.75)^2 = 0.44$ in.^{2}

$V_r = [(2 \times 0.025 \times 0.179 + 0.122)/0.772] \times 0.44$

$V_r = 0.13$ in.^{3} (2.1 ml)

Disc Brakes (front):

$V_r = (\Delta t_i + \Delta t_o + t_{ic} + t_{oc}) \times (\pi D^2)/4$

$\Delta t_i = 0.324$ in.

$\Delta t_o = 0.300$ in.

$t_{ic} = t_{oc} = 0$

$D = 2.38$ in.

$V_r = (0 + 0.324 + 0.300)[(\pi \times 2.38^2)/4]$

$V_r = 2.77$ in.^{3} (45.0 ml)

For System 1 (LF, RR)

$V_{r1} = 2.77$ in.^{3} + 0.13 in.^{3}

$V_{r1} = 2.90$ in.^{3} (47.1 ml)

For System 2 (LR, RF)

$V_{r2} = V_{r1} = 2.90$ in.^{3} (47.1 ml)

TOTAL VOLUME REQUIRED = $V_t = 5.8$ in.^{3} (94.3 ml)

APPENDIX 2

Veh. Test Speed (mph)	Stopping Distances in Feet for Tests Indicated													
	I-1st and 4th Effectiveness; spike effectiveness check				II-2nd Effectiveness			III-3rd (lightly loaded) Effectiveness				IV-Inop. Brake Power and Power Assist Unit; Partial Failure		
	(a)	(b)	(c)	(d)	(a)	(b) and (c)	(d)	(a)	(b)	(c)	(d)	(a)	(b) and (c)	(d)
30	57[1]	65[1,2]	69(1st)[1,2] 65(4th and spike)[1,2] 72[1]	88[1]	54[1]	57[1]	81[1]	51	57	65	81	114	130	170
35	74	83	91	132	70	74	132	67	74	83	132	155	176	225
40	96	108	119	173	91	96	173	87	96	108	173	202	229	288
45	121	137	150	218	115	121	218	110	121	137	218	257	291	358
50	150	169	185	264	142	150	264	135	150	169	264	317	359	435
55	181	204	224	326	172	181	326	163	181	204	326	383	433	530
60	216[1]	242[1]	267[1]	388[1]	204[1]	216[1]	388[1]	194[1]	216[1]	242[1]	388[1]	456[1]	517[1]	613[1]
80	405[1]	459[1]	510[1]	NA	383[1]	NA	NA	NA	NA	NA	NA	NA	NA	NA
95	607[1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
100	673[1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

[1] Distances for specified tests.

[2] Applicable to school buses only.

NA = Not Applicable

NOTE: (a) Passenger Cars

(b) Vehicles other than Passenger Cars with GVWR of less than 8,000 lbs

(c) Vehicles with GVWR of not less than 8,000 lbs and not more than 10,000 lbs

(d) Vehicles with GVWR greater than 10,000 lbs